

IDAHO DEPARTMENT OF FISH & GAME

Joseph C. Greenley, Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-49-R-16



SALMON AND STEELHEAD INVESTIGATIONS

Job No. 1-a. Salmon Spawning Ground Surveys

Period Covered: 1 March 1977 to 28 February 1978

by

Thomas L. Welsh, Regional Fishery Biologist
Steven A. Floss, Regional Fishery Biologist
Kent W. Ball, Regional Fishery Biologist

March, 1978

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JOB PERFORMANCE REPORT

State of Idaho Name: SALMON AND STEELHEAD INVESTIGATIONS
Project No. F-49-R-16 Title: Salmon Spawning Ground Surveys
Job No. 1-a
Period Covered: 1 March 1977 to 28 February 1978

ABSTRACT

Each year regional fishery biologists survey major chinook salmon spawning areas in their respective regions to count the number of redds constructed in trend count areas and to obtain age and sex composition data. The data are made available for trend analysis, management, and research use.

Redd counts, sex, and age data for 1977 are presented in a series of attached tables and maps.

Authors:

Thomas L. Welsh, Regional Fishery Biologist
Steven A. Hoss, Regional Fishery Biologist
Kent W. Ball, Regional Fishery Biologist

RECOMMENDATIONS

The redd count surveys, sex and age composition data collections should be continued to provide management data.

OBJECTIVES

To count chinook salmon redds in established trend areas.

To obtain age and sex composition data of the chinook spawning population.

TECHNIQUES USED

Redd counts are made from low flying, fixed-wing aircraft, helicopter, or on foot depending on which technique is best suited for a particular stream. Redds are counted when preliminary observations indicate that spawning is over and before redds become obscure from algae and silt.

Carcass surveys ideally are made three times during post-spawning die-off to eliminate bias in sex ratios noted early and late in the season.

Chinook redd counts are included for selected tributaries of the Clearwater River to assist evaluation of reintroduction efforts.

FINDINGS

Redd count surveys and sex and age composition data collections were made during the late summer of 1977. These data are summarized in attached tables and maps.

Very few jacks were on the spawning grounds in 1977 which indicates poor survival of progeny from the 1974 brood year. Smolts from the 1974 brood year would have migrated during the spring of 1976 and would be returning in 1978 as 2-year ocean fish. Jacks found in the upper South Fork may be the first returns from hatchery-reared summer chinook smolts planted at Knox Bridge in the spring of 1976. However, the number of jacks observed (13) was not large enough to indicate good survival of the hatchery smolts.

The sex composition of fish recovered on both the spring and summer chinook spawning areas was heavily weighted towards males. The disproportionate number of females may be attributable to the poor contribution of 5-year fish which normally runs 2 to 1 in favor of females.

There appeared to be a late movement of fish onto the Bear Valley and Elk Creek spawning areas. We have always noted a short upstream movement of gravid fish just prior to the onset of spawning, but this late movement was more pronounced in 1977.

Redd counts on some Clearwater River drainage streams may have been elevated due to stocking adults from Kooskia National Fish Hatchery.

Table 1. Salmon River drainage chinook salmon redd counts, 1977.

Streams	1972	1973	1974	1975	1976	5-yr avg.	1977
Spring chinook							
Alturas Lake Creek	143	153	42	60	16	83	85
Upper Salmon River	748	414	338	509	378	477	698
Upper Valley Creek	182	125	127	189	*	156**	18
Upper Yankee Fork	115	104	54	60	40	75	6
Upper East Fork	448	665	346	348	75	376	168
Herd Creek	28	47	13	11	27	25	6
Marsh Cr. Drainage	312	518	210	201	48	258	98
Lemhi River	507	485	248	366	241	369	474
North Fork Salmon R.	31	55	18	14	6	25	31
Bear Valley Creek	221	387	130	215	76	206	129
Elk Creek	212	369	108	169	61	184	86
Sulphur Creek	71	78	30	50	14	49	5
Upper Big Creek	60	<u>96</u>	<u>28</u>	<u>77</u>	<u>22</u>	<u>57</u>	<u>9</u>
Subtotal	3,078	3,496	1,692	2,269	1,004	2,340	1,813
Summer chinook							
Lower Salmon River	412	224	40	45	44	153	94
Lower Valley Creek	39	77	45	80	43	64	63
Lower East Fork	161	138	49	38	39	85	136
Loon Creek	150	78	47	32	31	68	62
South Fork Salmon R.	577	586	218	238	241	372	226
Johnson Creek	220	271	107	69	68	147	81
Secesh R.-Lake Cr.	87	62	<u>21</u>	<u>10</u>	<u>17</u>	<u>39</u>	<u>27</u>
Subtotal	1,646	1,436	527	512	483	921	689
Unclassified Spawners							
Camas Creek	211	358	172	128	61	186	84
Lower Yankee Fork	78	71	28	35	3	43	12
West Fork Yankee Fork	117	86	20	55	11	58	37
Middle Fork Salmon R.	33	<u>18</u>	<u>23</u>	<u>10</u>	<u>6</u>	<u>18</u>	<u>1</u>
Subtotal	<u>439</u>	<u>533</u>	<u>243</u>	<u>228</u>	<u>81</u>	<u>305</u>	<u>134</u>
Total	5,163	5,465	2,462	3,009	1,568	3,533	2,636

* Beaver dam washout prohibited redd counts.

** Four-year average, 1972-1975.

Table 2. Clearwater River drainage chinook salmon redd counts, 1977.

	Number of redds counted in:						
Streams	1972	1973	1974	1975	1976	5-yr avg..	1977
<u>Selway Drainage</u>							
Selway River	175	261	66	21	58	116	97
Bear Creek	25	26	10	5	14	16	18
Running Creek	11	21	4	0	3	8	2
Whitecap Creek	8	7	2	1	4	4	1
Moose Creek	13	32	15	4	15	16	23
Subtotal	232	347	97	31	94	160	141
Lochsa Drainage							
Crooked Fork	32	60	22	31	49	39	80
Brushy Fork ^{1/}	--	--	6	4	13	--	15
Subtotal	32	60	28	35	62		95
South Fork Drainage ^{1/}							
Newsome Creek	--	--	3	6	5	--	26
Crooked River	--	--	5	33	13	--	71
Red River	--	--	12	20	15	--	62
Subtotal	<u>--</u>	<u>--</u>	<u>20</u>	<u>59</u>	<u>33</u>	<u>--</u>	<u>159</u>
Total	264	407	145	125	189		395

^{1/} Counting began in 1974.

Table 3. Length frequency distribution for spring chinook kelts, 1977.

Fork length (in)	Bear Valley Creek		Elk Creek		Sulphur Creek		Big Creek (Upper)	
	Female	Male	Female	Male	Female	Male	Female	Male
22				1				
23	--	--	--	--	--	--	--	--
Subtotal	0	0	0	1	0	0	0	0
24		2						
25		6		2				
26	2	5		5				1
27	3	19		7				
28	1	17	1	13		1		3
29	3	11	1	9		1		
30	6	13	2	9				1
31	<u>2</u>	<u>5</u>		<u>9</u>				<u>1</u>
Subtotal	17	78	4	54	0	2	0	6
32	1	1	1	1				
33	1		2	2				
34	3	2	2					
35	2	1					1	
36	4		2					
37	3		3					
38		2	2					
39		2						
40								
41		<u>1</u>						
Subtotal	14	9	12	3	0	0	1	0
Grand total	31	87	16	58	0	2	1	6

Table 3 (Cont'd.). Length frequency distribution for spring chinook kelts,
1977.

Fork length (in)	Lemhi River		Marsh Creek Drainage		Upper Salmon River		Upper East Fork	
	Female	Male	Female	Male	Female	Male	Female	Male
18						1		
19						1		
20					1	5		
21		1				11		
22		1				13		
23	--	--	--	--	3	39	--	--
Subtotal	0	2	0	0	4	70	0	2
24					2	40		
25			2	1	4	39		
26			1	2	8	46	2	
27	1		3	1	8	56		
28	1	1		3	4	55		
29		4	2	1	7	36	1	
30	1			1	15	37	1	2
31	--	--	--	--	11	14	1	--
Subtotal	3	5	8	9	59	323	5	2
32			1	1	15	16	2	
33					18	5	2	3
34	4				27	6	4	2
35			1		22	3	5	
36	1		2		42	11	9	
37		1	2		32	11	9	3
38					13	4	11	3
39					6	11	3	3
40					3	12	1	4
41				1	2	15		2
						7	1	2
43						5		2
44								
45	--	--	--	--	--	--	--	1
Subtotal	5	1	6	2	180	107	47	25
Grand total	8	8	14	11	243	500	52	29

Table 4. Length frequency distribution for summer chinook kelts, 1977.

Fork length (in)	Johnson Creek		Lake Creek & Secesh River		South Fork Salmon River	
	Female	Male	Female	Male	Female	Male
18		1				3
19		1				1
20		1				
21						4
22		1				2
23						
24		3				3
Subtotal	0	7	0	0	0	13
25		10				14
26		11		1	1	23
27		45		4	2	38
28		43		4	7	40
29	2	46		8	10	70
30	1	32		11	14	47
31	2	22	1	5	7	35
32	3	13	1		5	11
33		2		2	3	8
Subtotal	8	224	2	35	49	286
34		2			2	4
35		1			1	2
36	2	1			2	3
37	1				1	
38		3			1	
39		1				2
Subtotal	3	8	0	0	7	11
Grand total	11	239	2	35	56	310

Table 5. Percent age composition, by sex, of spring chinook kelts, 1977.

<u>Stream and age group</u>	<u>Females</u>	<u>Males</u>	<u>Males and Females</u>
<u>Lemhi River</u>			
Age group 3 ₂		25	12.5
Age group 4 ₂	37.5	62.5	50
Age group 5 ₂	62.5	12.5	37.5
	100.0 (n=8)	100.0 (n=8)	100.0 (n=16)
<u>Marsh Creek Drainage</u>			
Age group 3 ₂	--	--	--
Age group 4 ₂	57	82	68
Age group 5 ₂	43	18	32
	100 (n=14)	100 (n=11)	100 (n=25)
<u>Upper Salmon River</u>			
Age group 3 ₂	2	14	10
Age group 4 ₂	24	65	51
Age group 5 ₂	74	21	39
	100 (n=243)	10 (n=500)	100 (n=743)
<u>Upper East Fork</u>			
Age group 3 ₂	--	6	2
Age group 4 ₂	10	13	11
Age group 5 ₂	90	81	87
	100 (n=52)	100 (n=52)	100 (n=83)

Table 5 (Cont'd.). Percent age composition, by sex, of spring chinook kelts, 1977.

<u>Stream and age group</u>	<u>Females</u>	<u>Males</u>	<u>Males and</u>
<hr/>			
Bear Valley Creek			
Age group 3 ₂	0	0	0
Age group 4 ₂	55	90	81
Age group 5 ₂	45	10	19
	100	100	100
	(n=31)	(n=87)	(n=118)
Elk Creek			
Age group 3 ₂	0	1	1
Age group 4 ₂	25	95	81
Age group 5 ₂	75	4	18
	100	100	100
	(n=16)	(n=61)	(n=77)
Sulphur Creek			
Age group 3 ₂	0	0	0
Age group 4 ₂	0	100	100
Age group 5 ₂	0	0	0
	0	100	100
	(n=0)	(n=2)	(n=2)
<u>Big Creek (Upper)</u>			
Age group 3 ₂	0	0	0
Age group 4 ₂	0	100	83
Age group 5 ₂	100	0	17
	100	100	100
	(n=1)	(n=6)	(n=7)
<hr/>			

Table 6. Percent age composition, by sex, of summer chinook kelts, 1977.

Stream and age group	Female	Males	Males and
<u>Johnson Creek</u>			
Age group 3 ₂	0	1	1
Age group 4 ₂	73	93	92
Age group 5 ₂	27	6	<u>7</u>
	100 (n=1)	100 (n=246)	100 (n=257)
<u>Lake Creek and Secesh River</u>			
Age group 3 ₂	0	0	0
Age group 4 ₂	100	100	100
Age group 5 ₂	0	0	0
	100 (n=2)	100 (n=35)	100 (n=37)
<u>South Fork Salmon River</u>			
Age group 3 ₂	0	4	4
Age group 4 ₂	88	92	91
Age group 5 ₂	12	4	<u>5</u>
	100 (n=56)	100 (n=310)	100 (n=366)

APPENDIX

LEGEND

Ground Survey Sections

Aerial Survey Sections

Ground Redd Counts

Aerial Redd Counts

Aerial-Ground Check Areas

Aerial-Ground Check Area Count

Migratory Block

Road

Trail

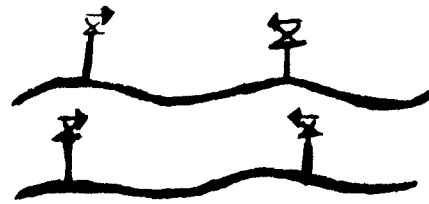
Forest Service Stations

Landing Strip

Fence

Pack Bridge

Highway Bridge



DRAINAGE Salmon River

SURVEY DATE August 26 & Sept. 1 & 2

STREAM Salmon River

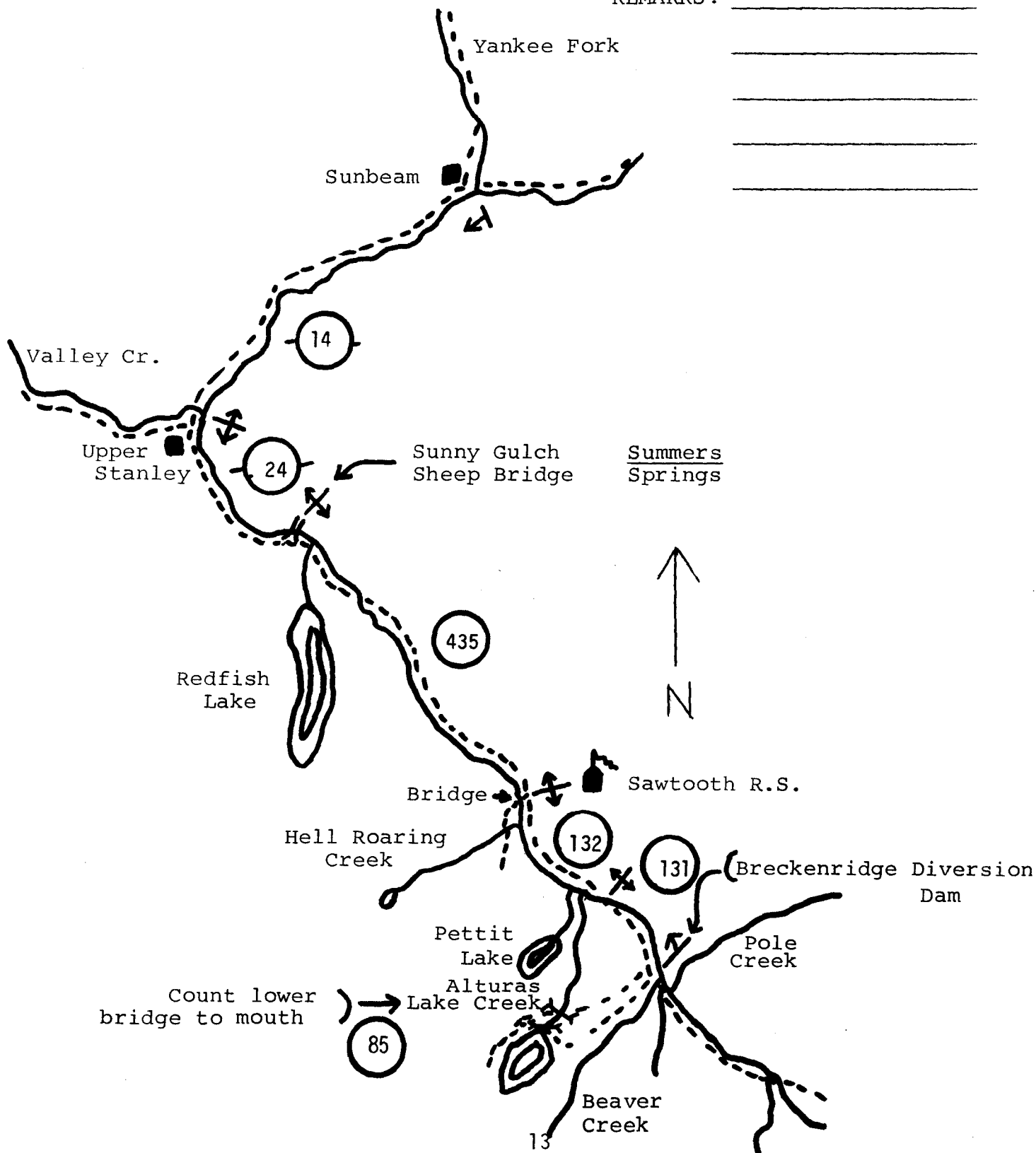
MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Overcast

REINGOLD, JEPPESON
OBSERVER Ball, Moore, McCabe, Swan

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE Salmon River

SURVEY DATE September 1

STREAM Salmon River

MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good

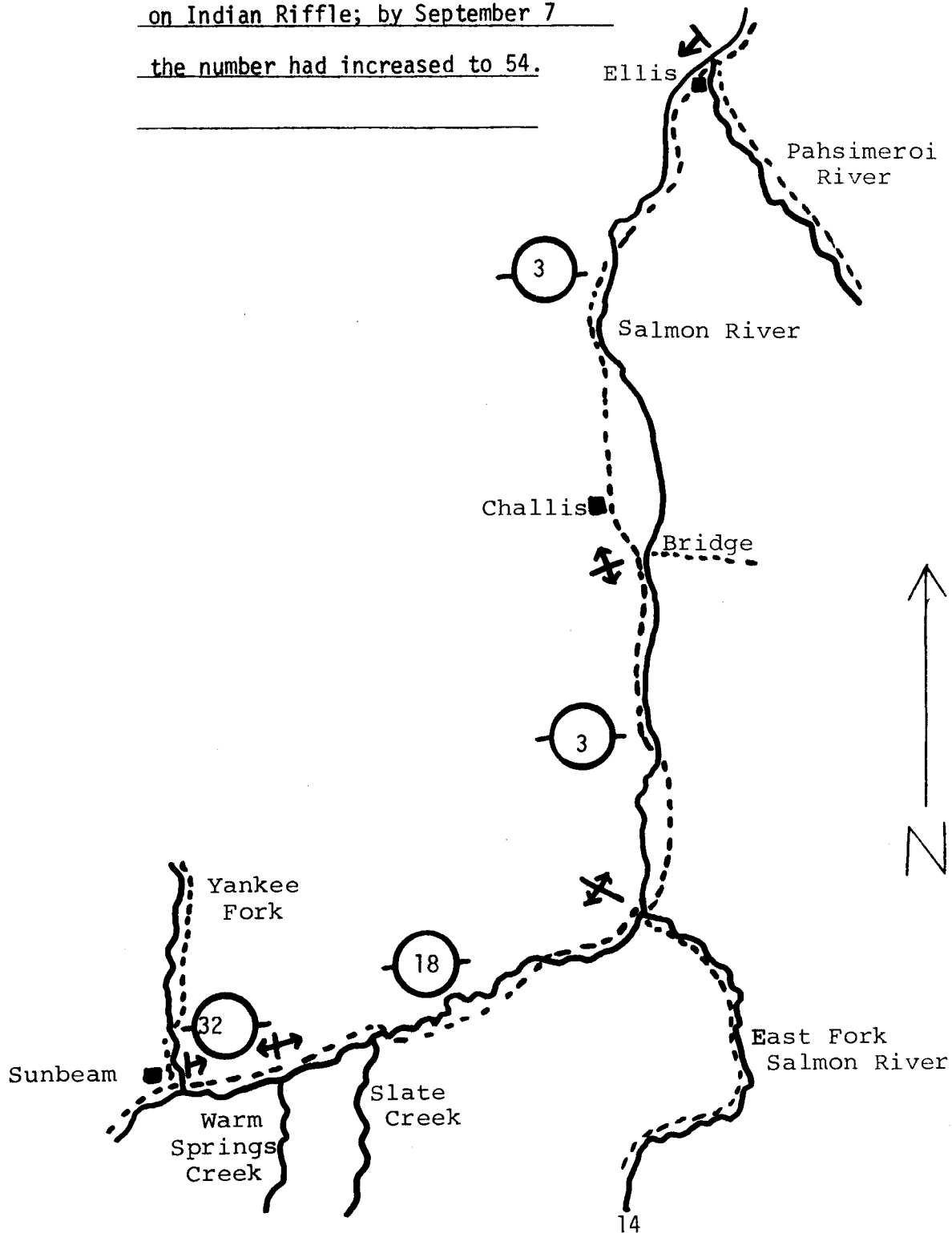
OBSERVER Ball

TIMING: Early On Time Late (mark one)

REMARKS: On September 1, 3 redds were counted

on Indian Riffle; by September 7

the number had increased to 54.



DRAINAGE Salmon River

SURVEY DATE September 1, 1977

STREAM Salmon River

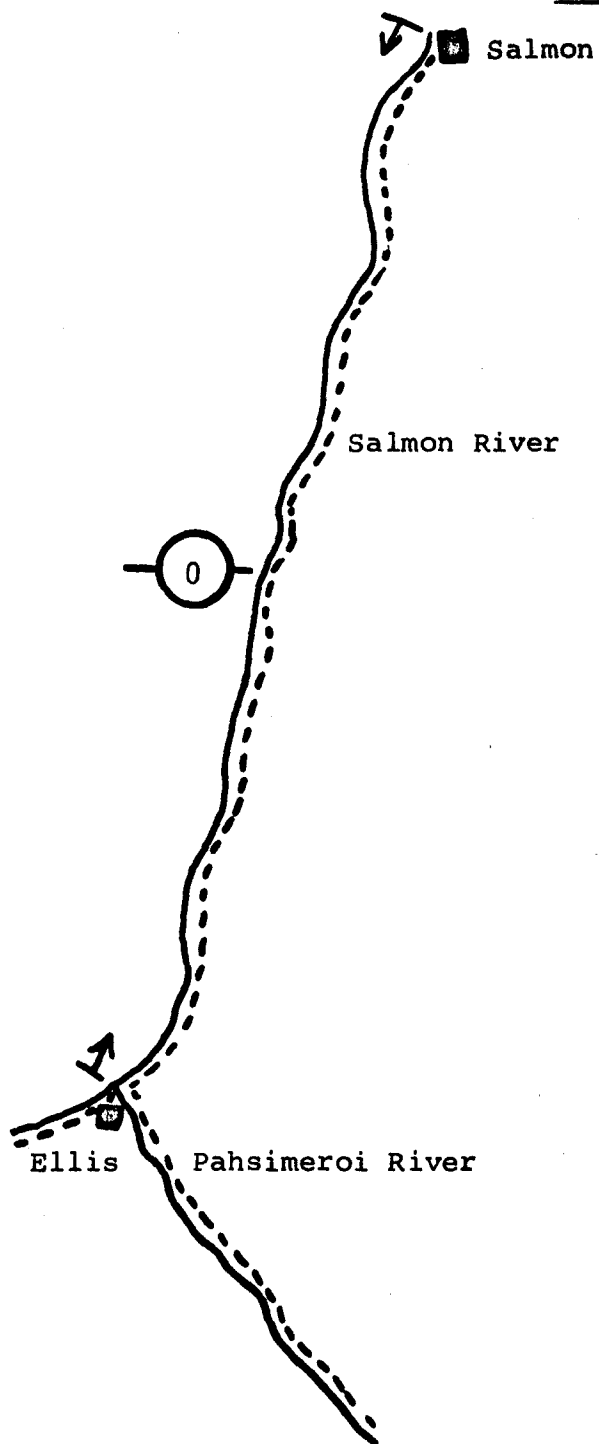
MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE Salmon River

SURVEY DATE August 22 & 31, 1977

STREAM Valley Creek

MAP SCALE 2/3" = 1 mile

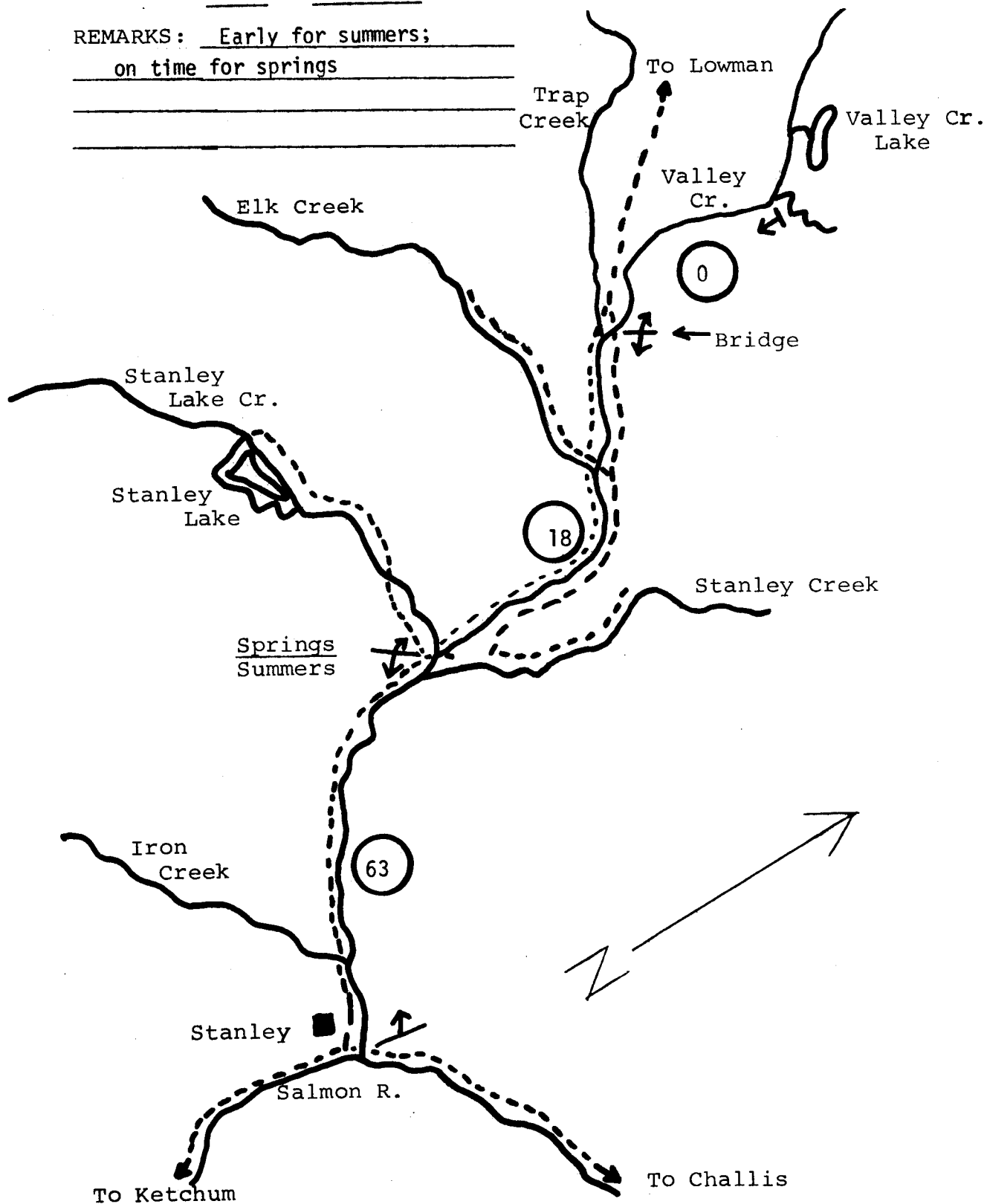
OBSERVATION CONDITIONS Fair

OBSERVER McCabe, Manis, Ruehle, Moore

TIMING: Early On Time Late (mark one)

REMARKS: Early for summers;

on time for springs



DRAINAGE Salmon River

SURVEY DATE August 24 & Sept 2, 1977

STREAM East Fork

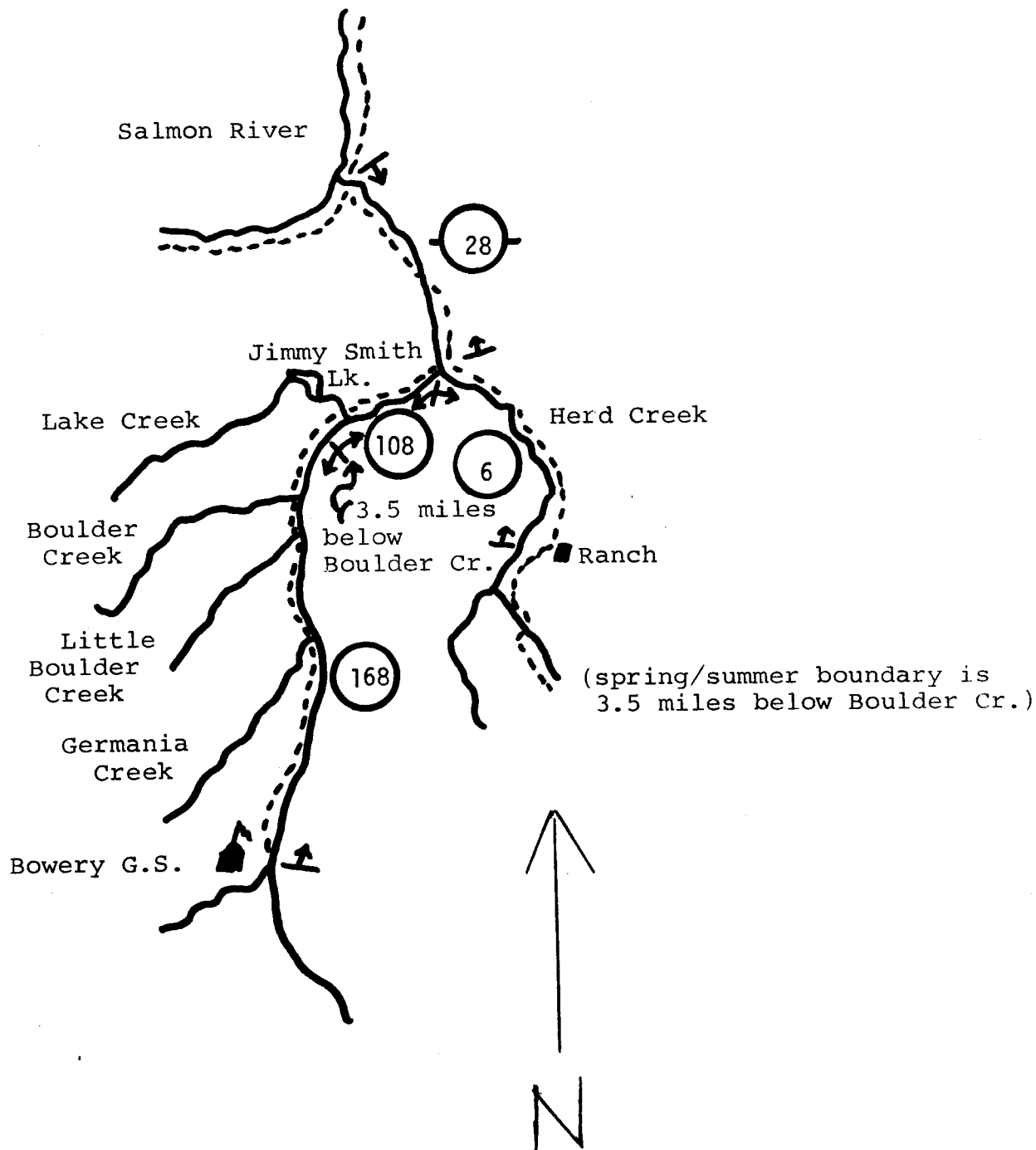
MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Fair

OBSERVER Ball, Williams, Manis, Moore,
Ruehle

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE Salmon River

SURVEY DATE September 6, 7, & 9, 1977

STREAM Lemhi River

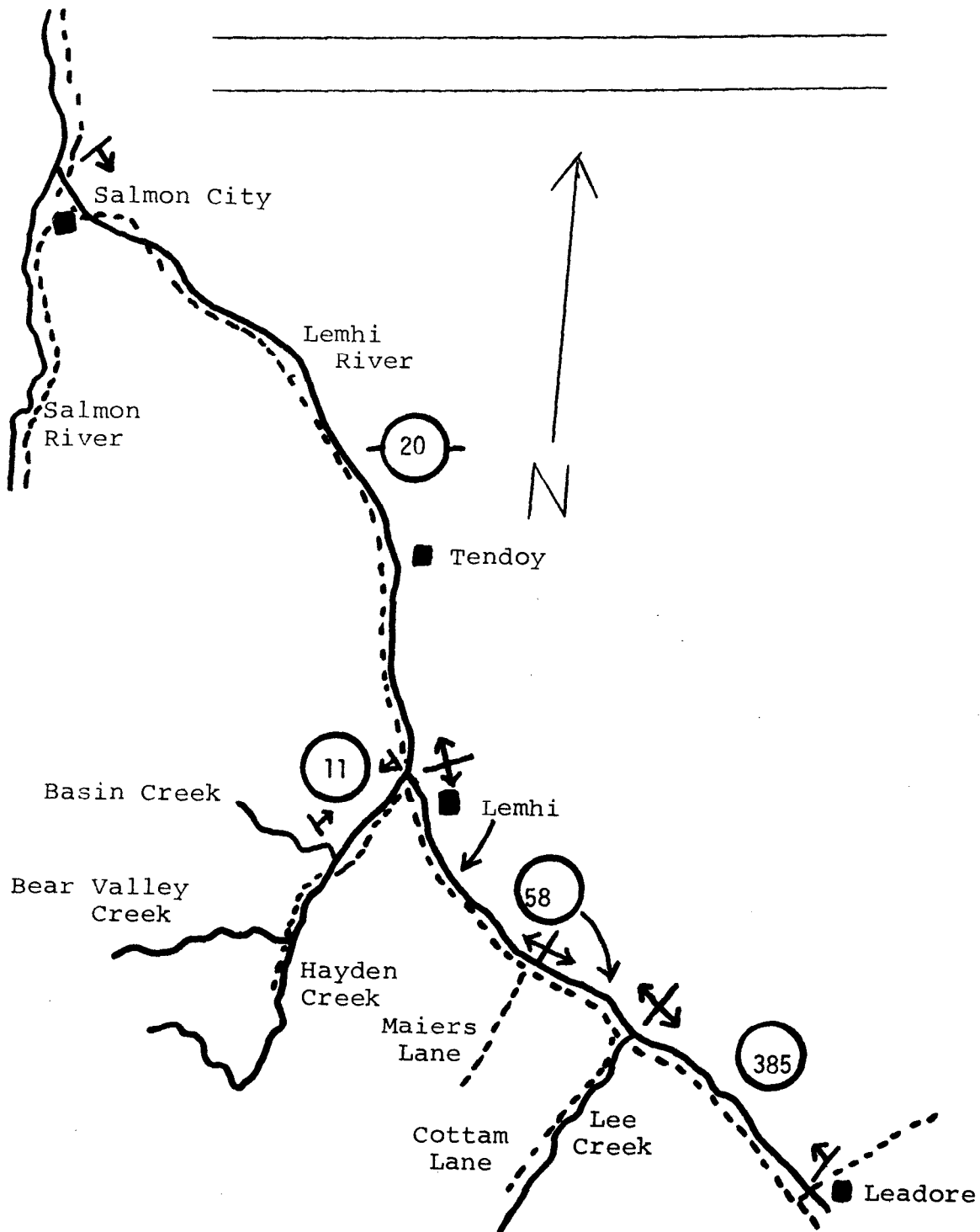
MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Tetz, McCabe, Swan, Anderson ^{Moore}

TIMING: Early On Time Late (mark one)

REMARKS: Maiers Lane to mouth counted as one section.



DRAINAGE Salmon River

SURVEY DATE August 29, 1977

STREAM North Fork

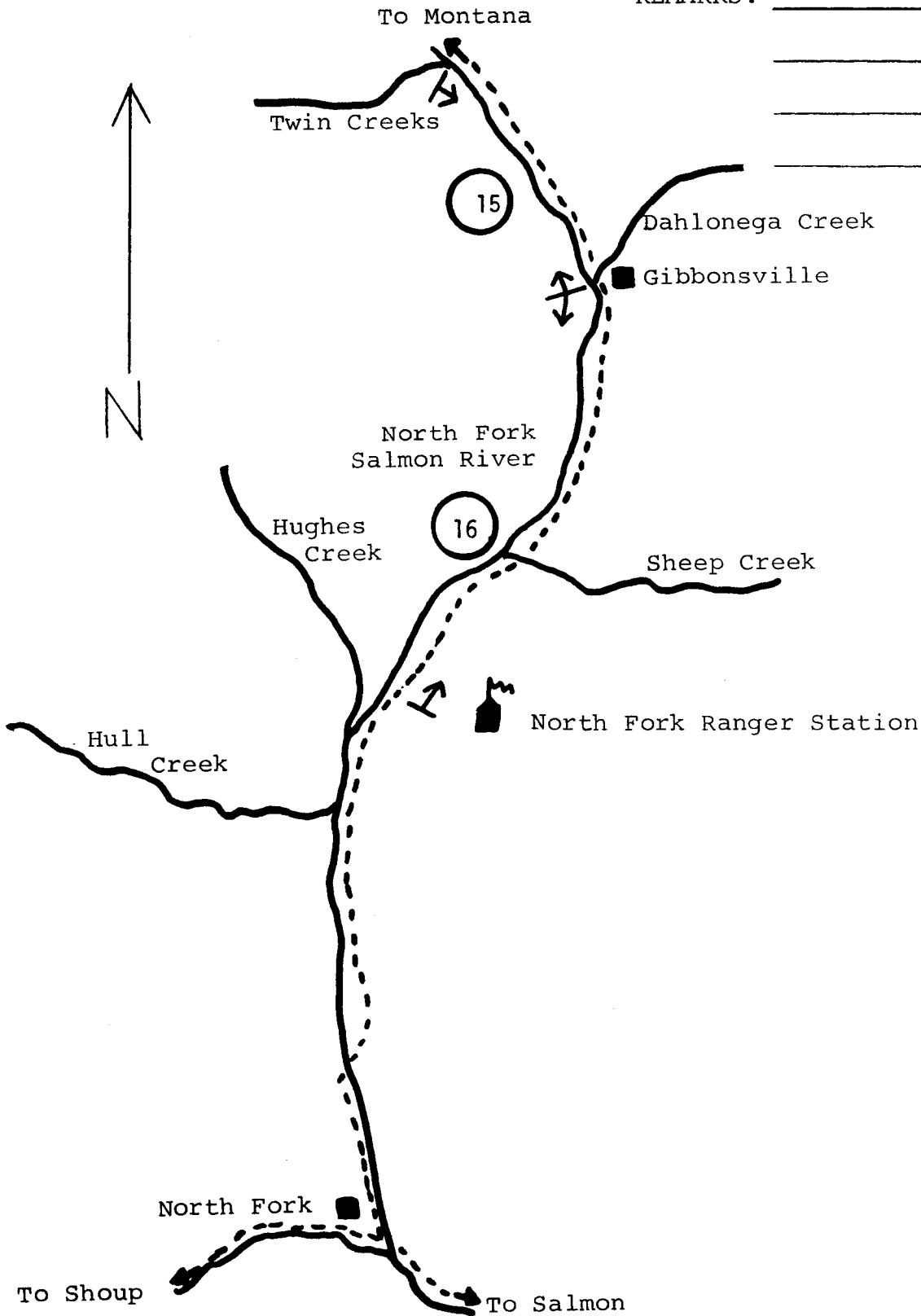
MAP SCALE 1/2" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Moore

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE Salmon River

SURVEY DATE September 1, 1977

STREAM M. F. Salmon River

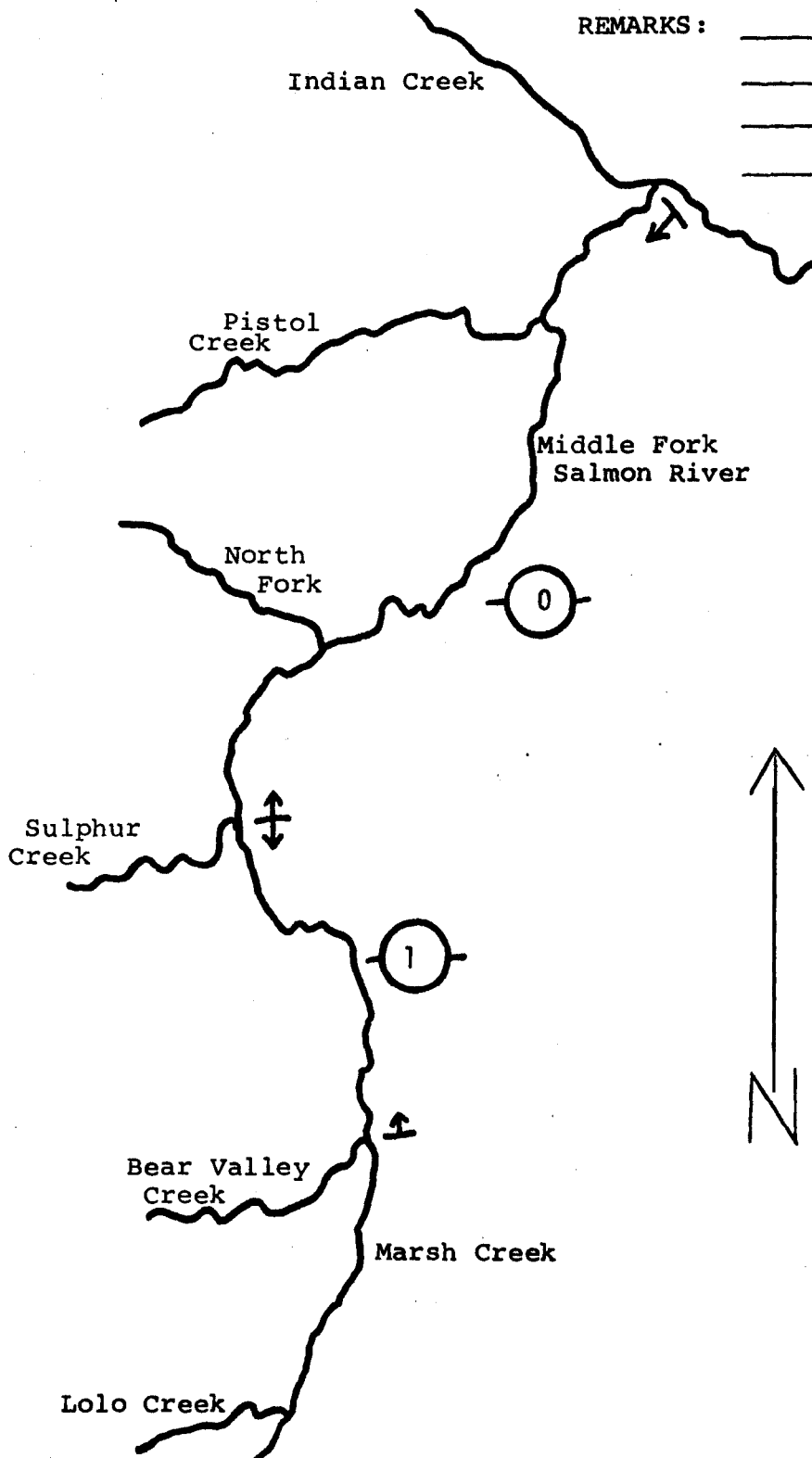
MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball

TIMING: Early On Time Late (mark one)

REMARKS: _____



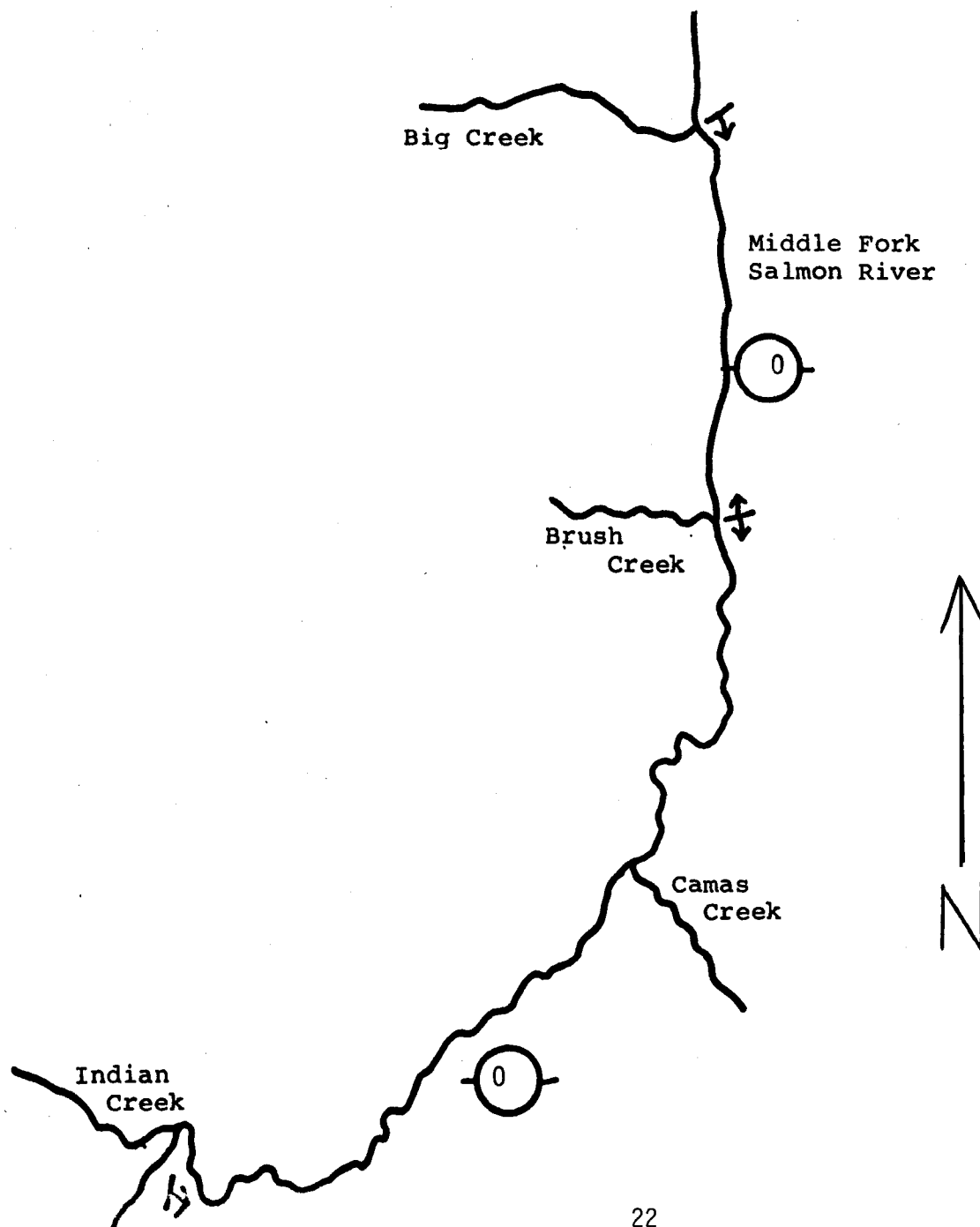
DRAINAGE Salmon River SURVEY DATE September 1, 1977

STREAM M. F. Salmon River MAP SCALE 1/4" = 1 mile

OBSERVATION CONDITIONS Good OBSERVER Ball

TIMING: Early On Time Lake (mark one)

REMARKS: _____



DRAINAGE Middle Fork Salmon River

SURVEY DATE September 7, 1977

STREAM Loon Creek

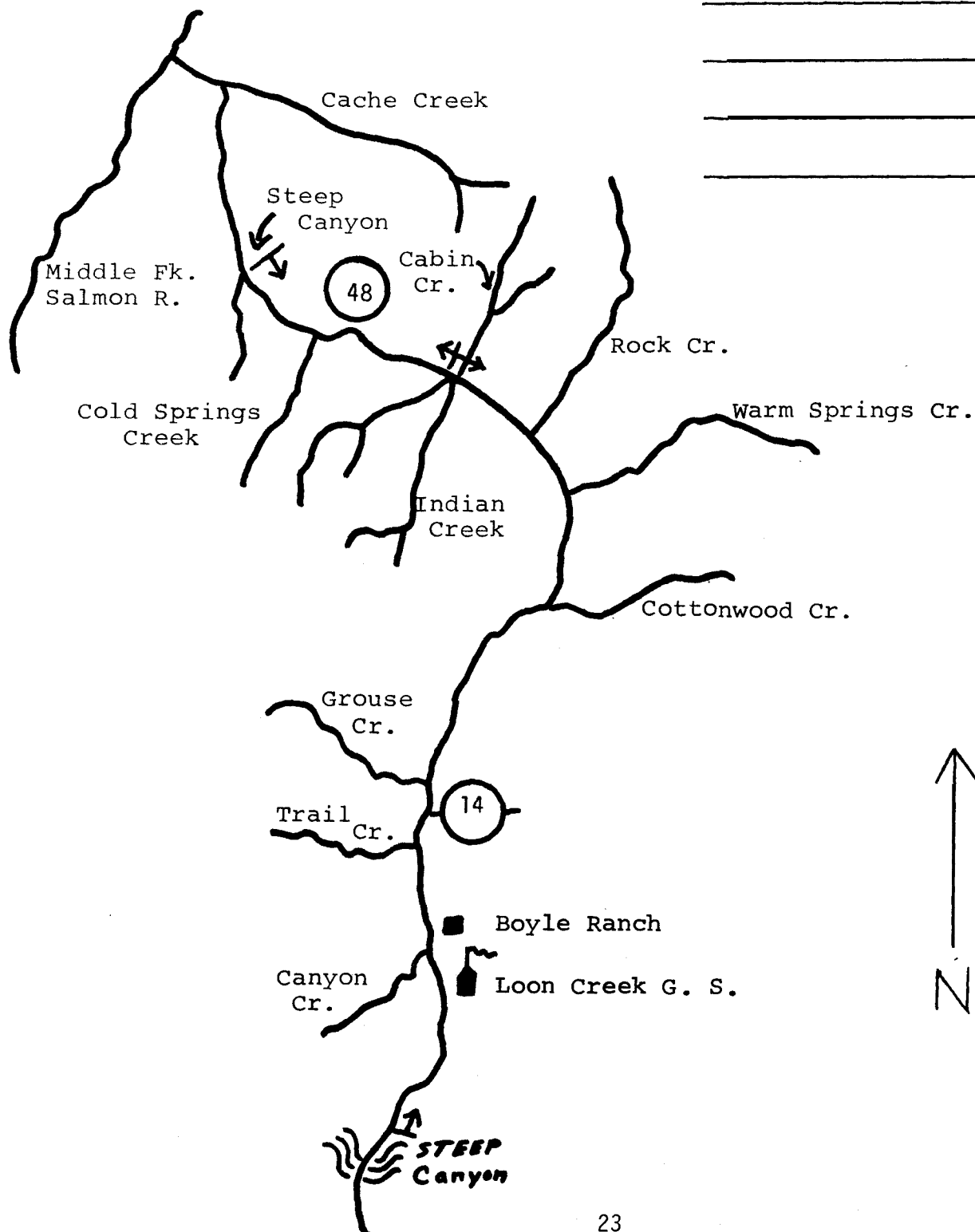
MAP SCALE 1/3" = 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Moore

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE M. F. Salmon River

SURVEY DATE August 24 & 30, 1977

STREAM Camas Creek

MAP SCALE 1/4" = 1 mile

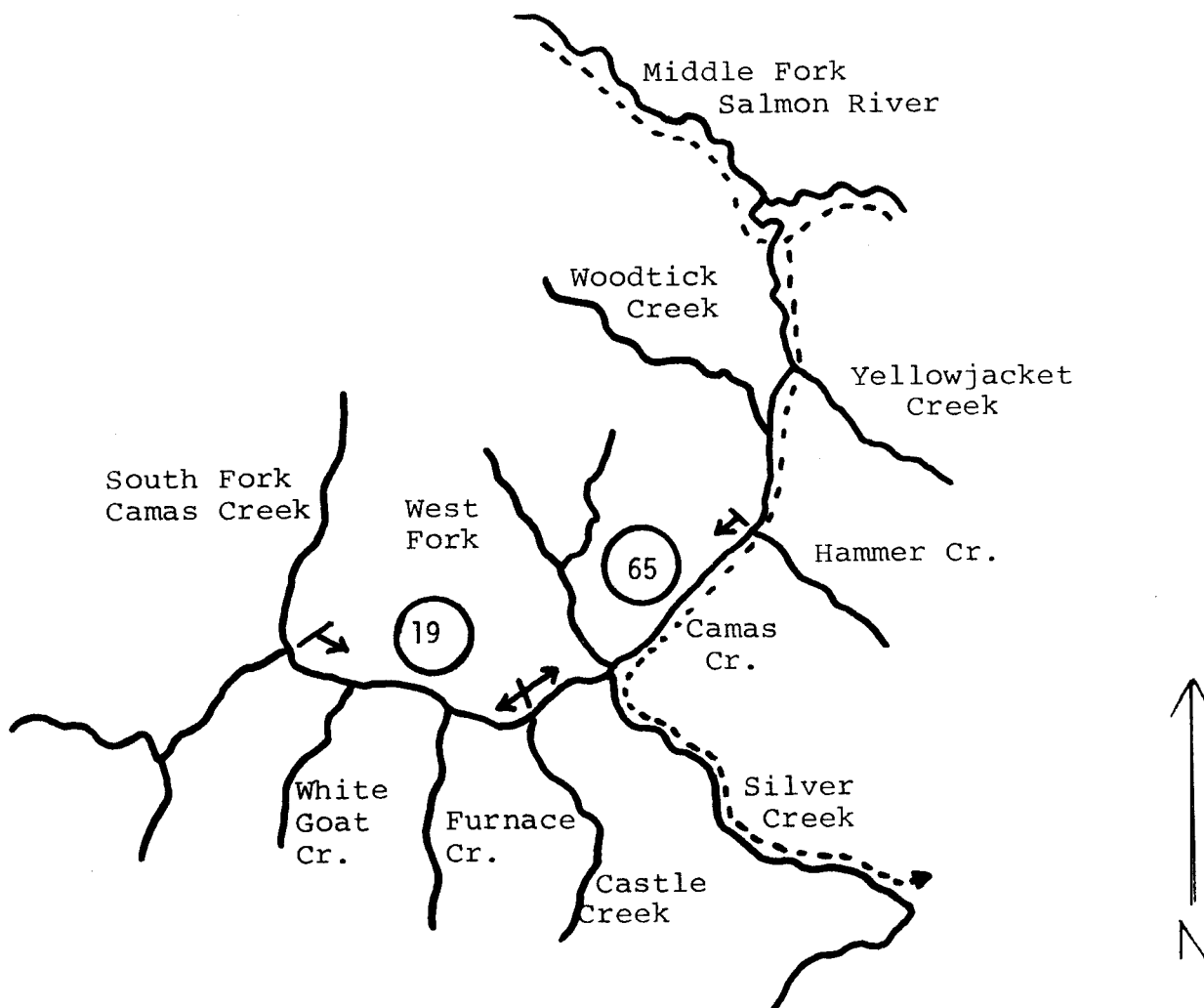
OBSERVATION CONDITIONS Poor

OBSERVER Ball, Kozacek, Moore

TIMING: Early On Time Late (mark one)

REMARKS: On 8-30-77 it was raining making

observation conditions poor



DRAINAGE M. F. Salmon River

SURVEY DATE 9/1/77

STREAM Bear Valley Creek

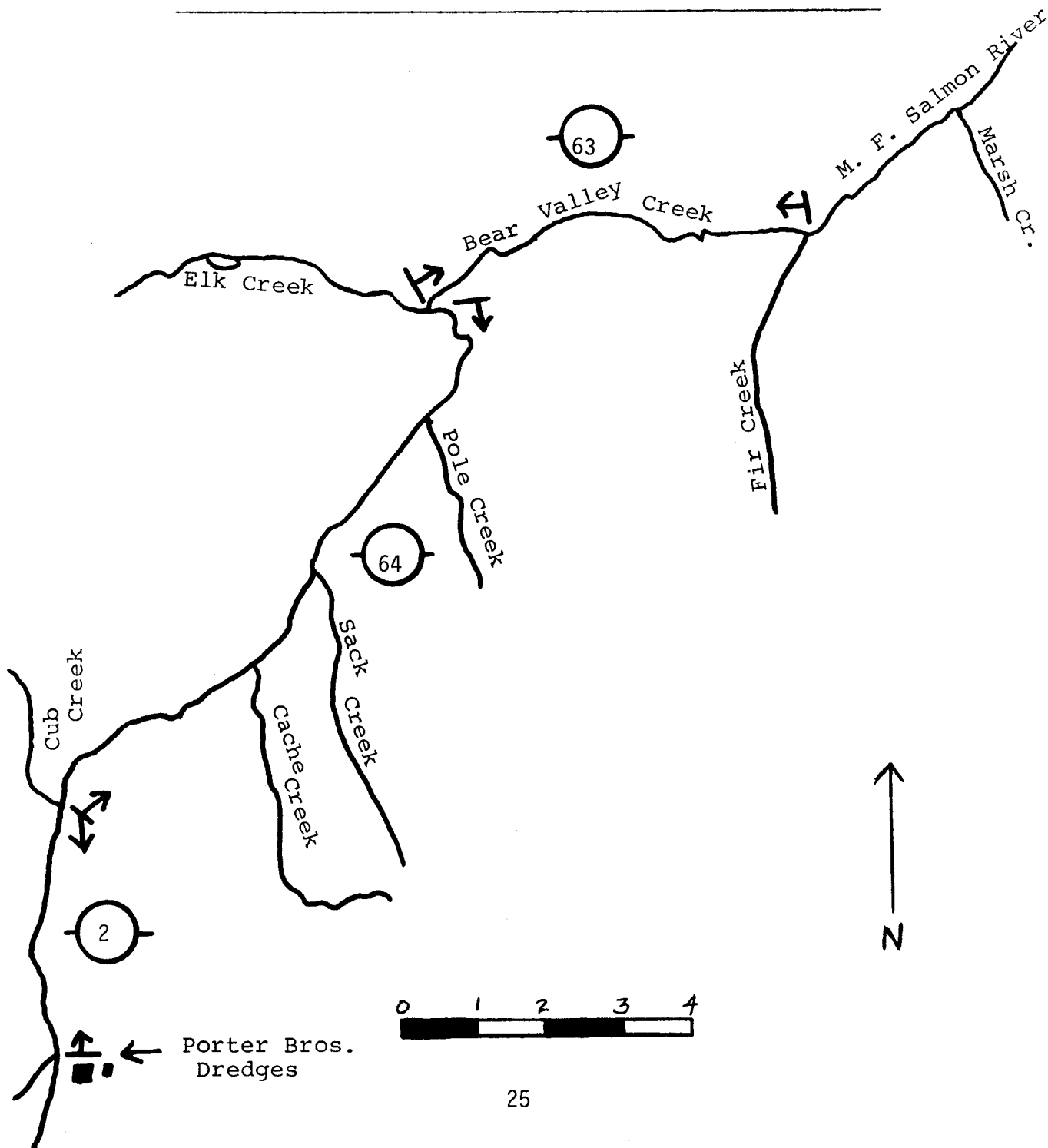
MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS Excellent

OBSERVER Welsh

TIMING: ~~Early~~ On Time ~~Late~~ (mark one)

REMARKS: Observed a late movement of fish into Bear Valley Creek.



DRAINAGE M. F. Salmon River

SURVEY DATE 9/1/77

STREAM Elk Creek

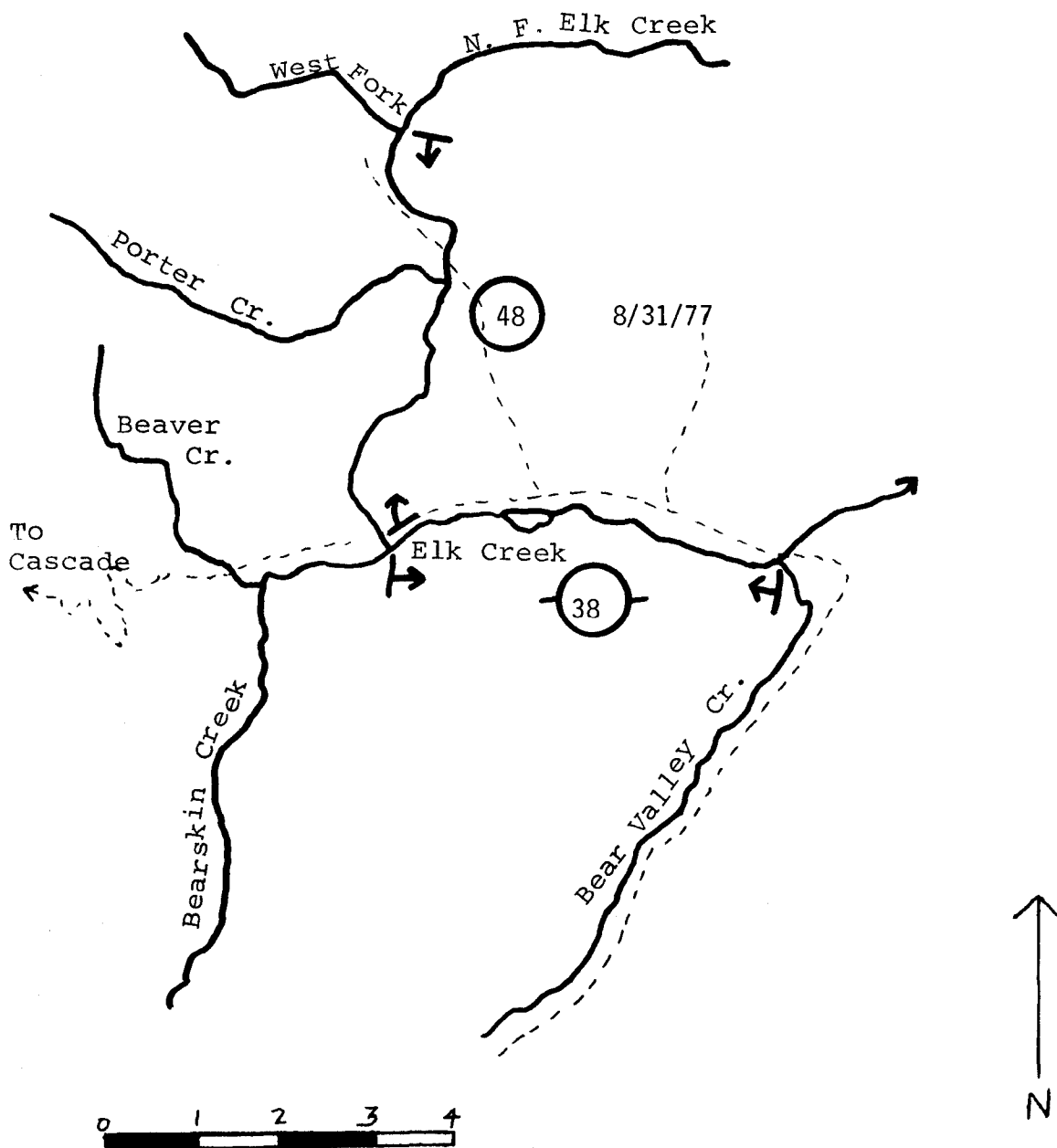
MAP SCALE 1" = 2 miles

OBSERVATION CONDITIONS good

OBSERVER Welsh

TIMING: ~~Early~~ On time ~~Late~~ (mark one)

REMARKS: Numerous beaver dams completely blocked the channel on upper Elk Creek but early arriving salmon were successful in ascending the dams. Low flows allowed the beaver to construct dams across the main channel.



DRAINAGE M. F. Salmon River
Marsh, Beaver, Knapp,
STREAM Capehorn Creeks

SURVEY DATE August 16 and 18, 1977

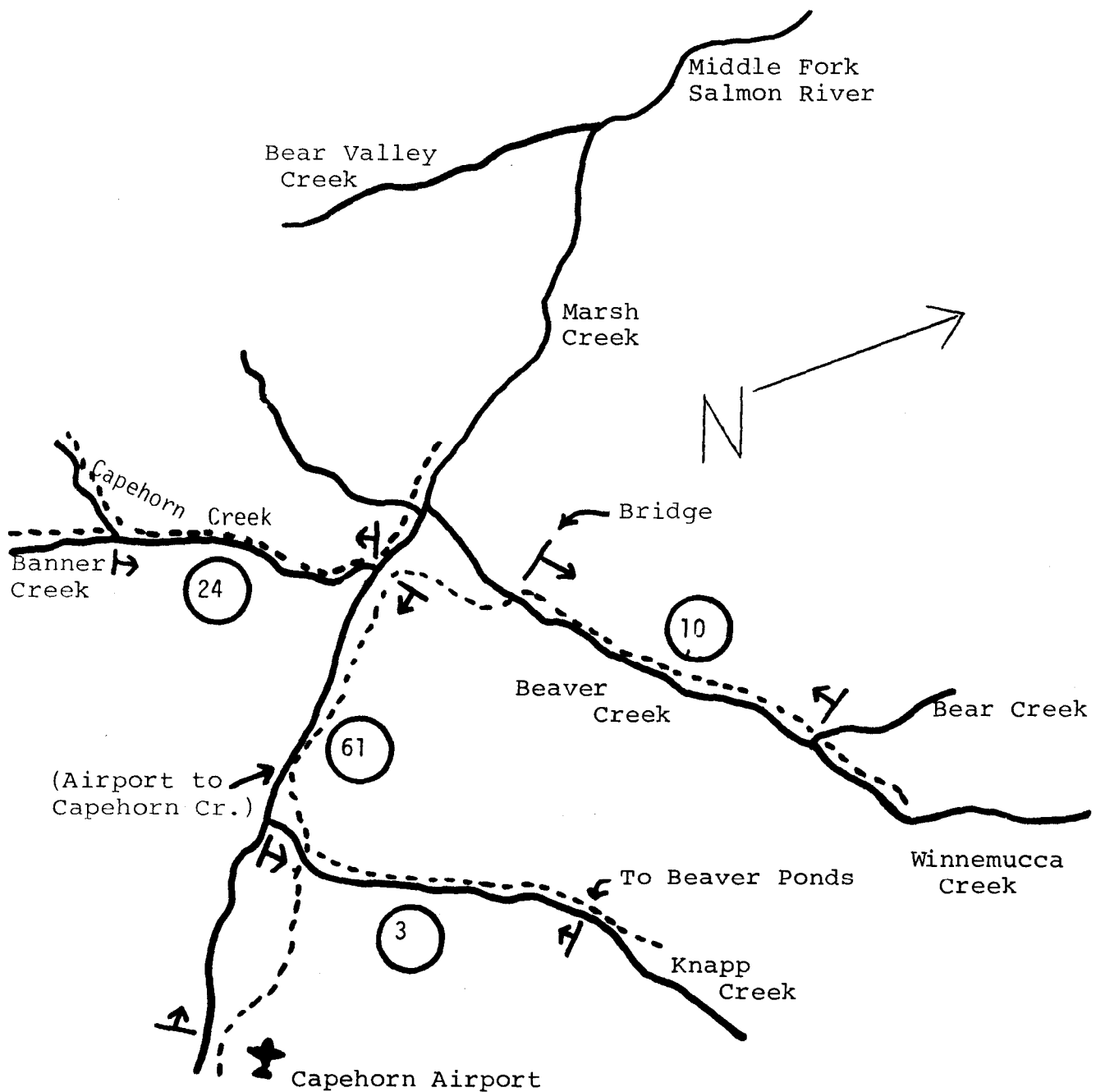
MAP SCALE 2/3" - 1 mile

OBSERVATION CONDITIONS Good

OBSERVER Ball, Reingold, Moore, Ruehle, Manis

TIMING: Early On Time Late (mark one)

REMARKS: _____



DRAINAGE M. F. Salmon River

SURVEY DATE 8/18/77

STREAM Sulphur Creek

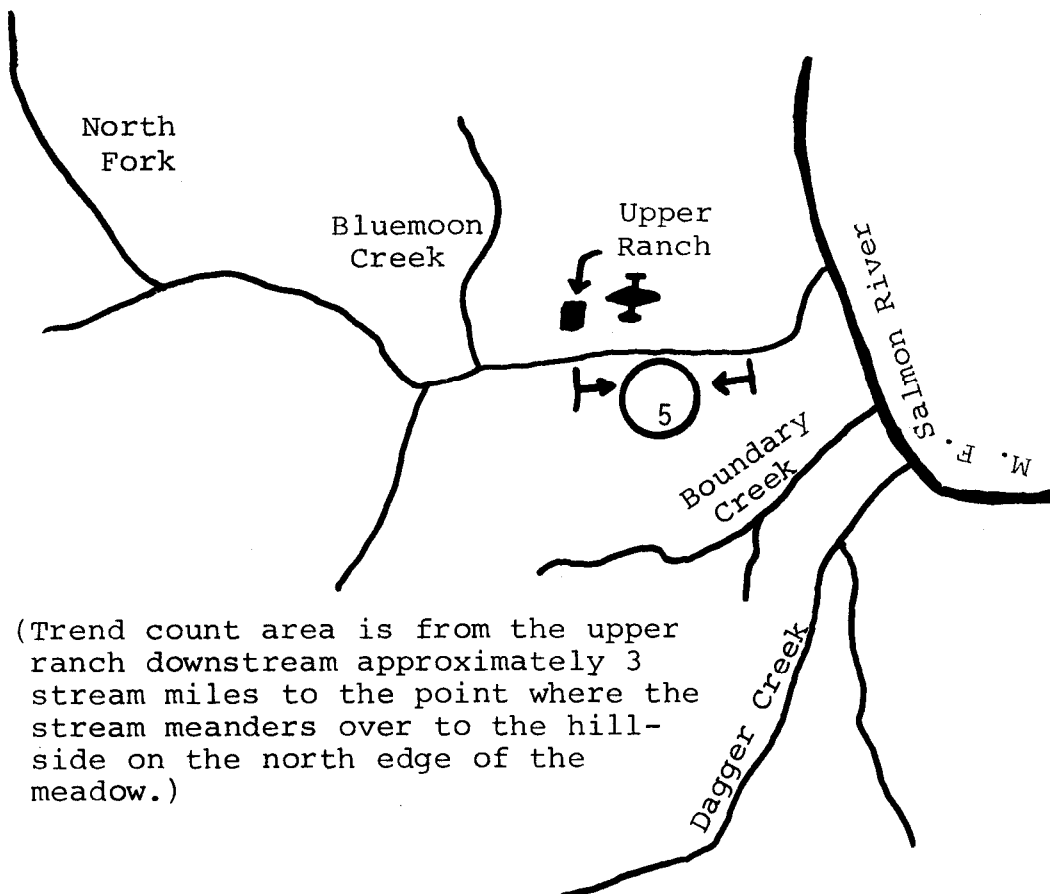
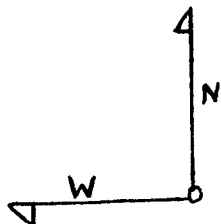
MAP SCALE 1/6" = 1 mile

OBSERVATION CONDITIONS good

OBSERVER Welsh

TIMING: ~~XXXXXX~~ ~~Early~~ On Time ~~XXXX~~ ~~Late~~ (mark one)

REMARKS: Flew Sulphur Creek on 9/1/77 and saw no beaver dams across the
channel below the trend area.



(Trend count area is from the upper ranch downstream approximately 3 stream miles to the point where the stream meanders over to the hillside on the north edge of the meadow.)

DRAINAGE M. F. Salmon River

SURVEY DATE 9/1/77

STREAM Big Creek

MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS Good

OBSERVER Welsh

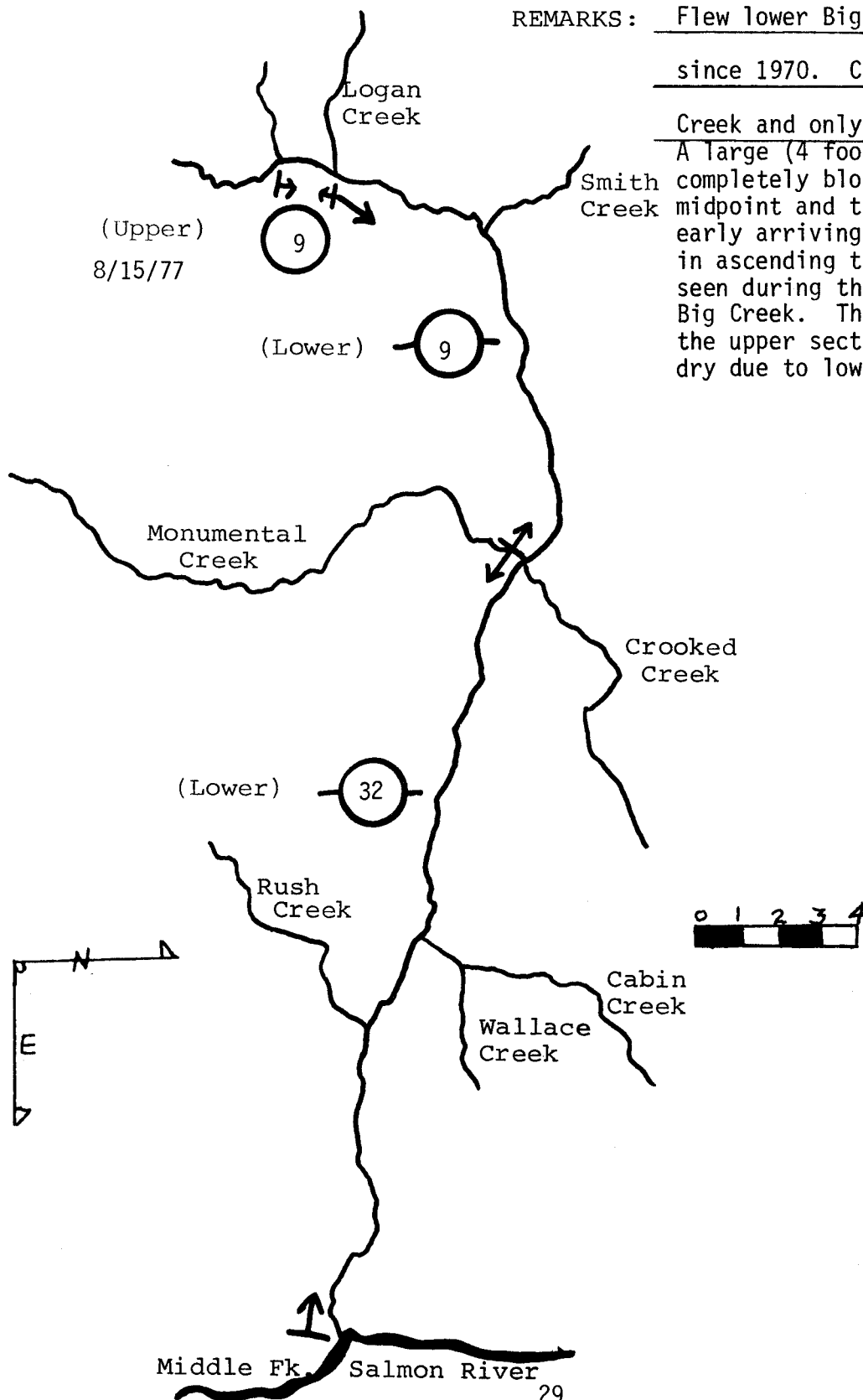
TIMING: ~~Early~~ On Time ~~Late~~ (mark one)

REMARKS: Flew lower Big Creek for first time

since 1970. Counted 8 redds at Cove

Creek and only 2 redds at Taylor Ranch.

A large (4 foot high) beaver dam completely blocked the channel at the midpoint and the upper section but early arriving salmon were successful in ascending the dam. No dams were seen during the aerial flight of lower Big Creek. The upper 500 yards of the upper section were completely dry due to low stream flows.



DRAINAGE Salmon River

SURVEY DATE 9/10/77

STREAM S. F. Salmon River

MAP SCALE 1/4" - 1 mile

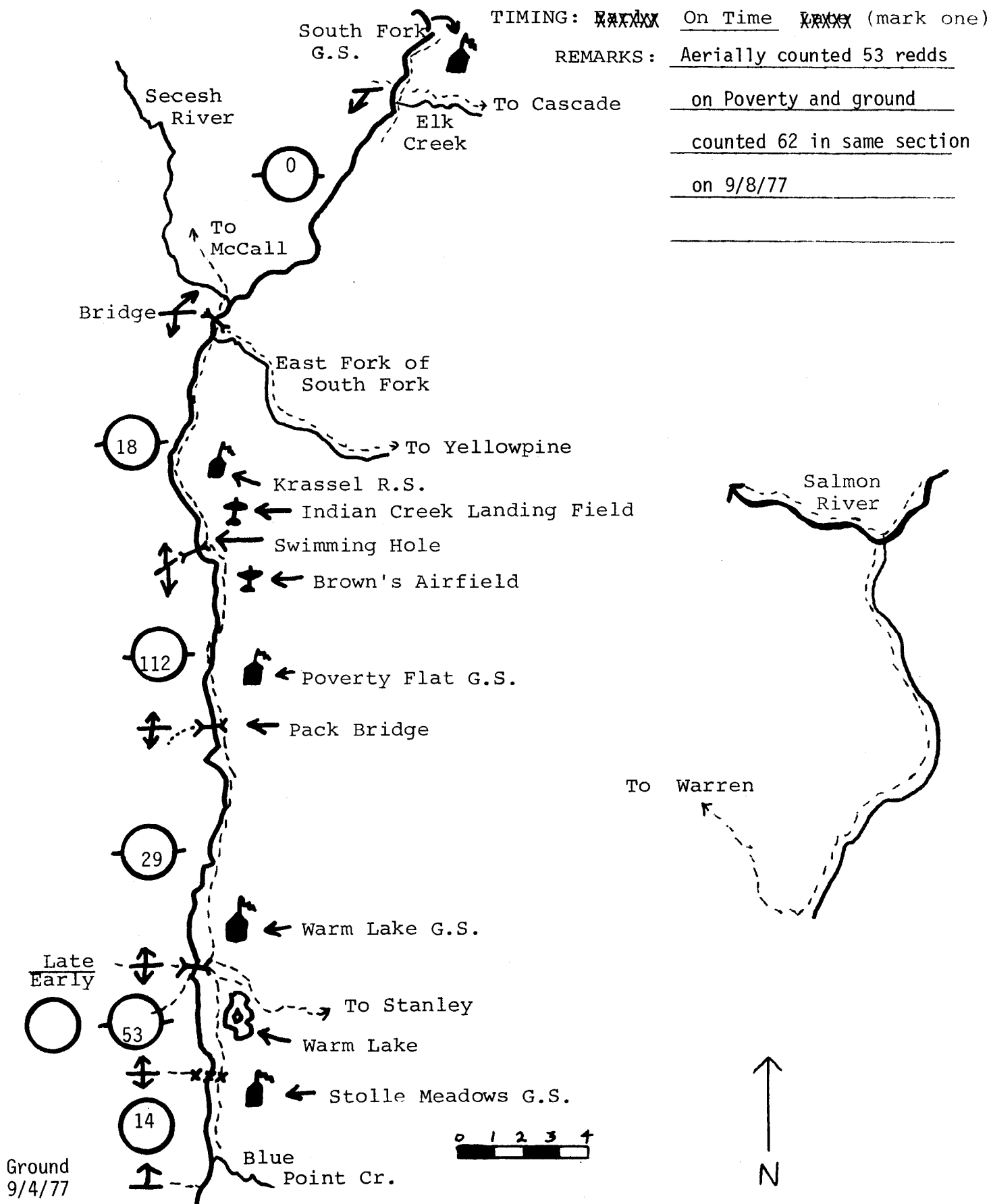
OBSERVATION CONDITIONS Excellent

OBSERVER Tom Welsh

0

TIMING: ~~Early~~ On Time ~~Late~~ (mark one)

REMARKS: Aerially counted 53 redds
on Poverty and ground
counted 62 in same section
on 9/8/77



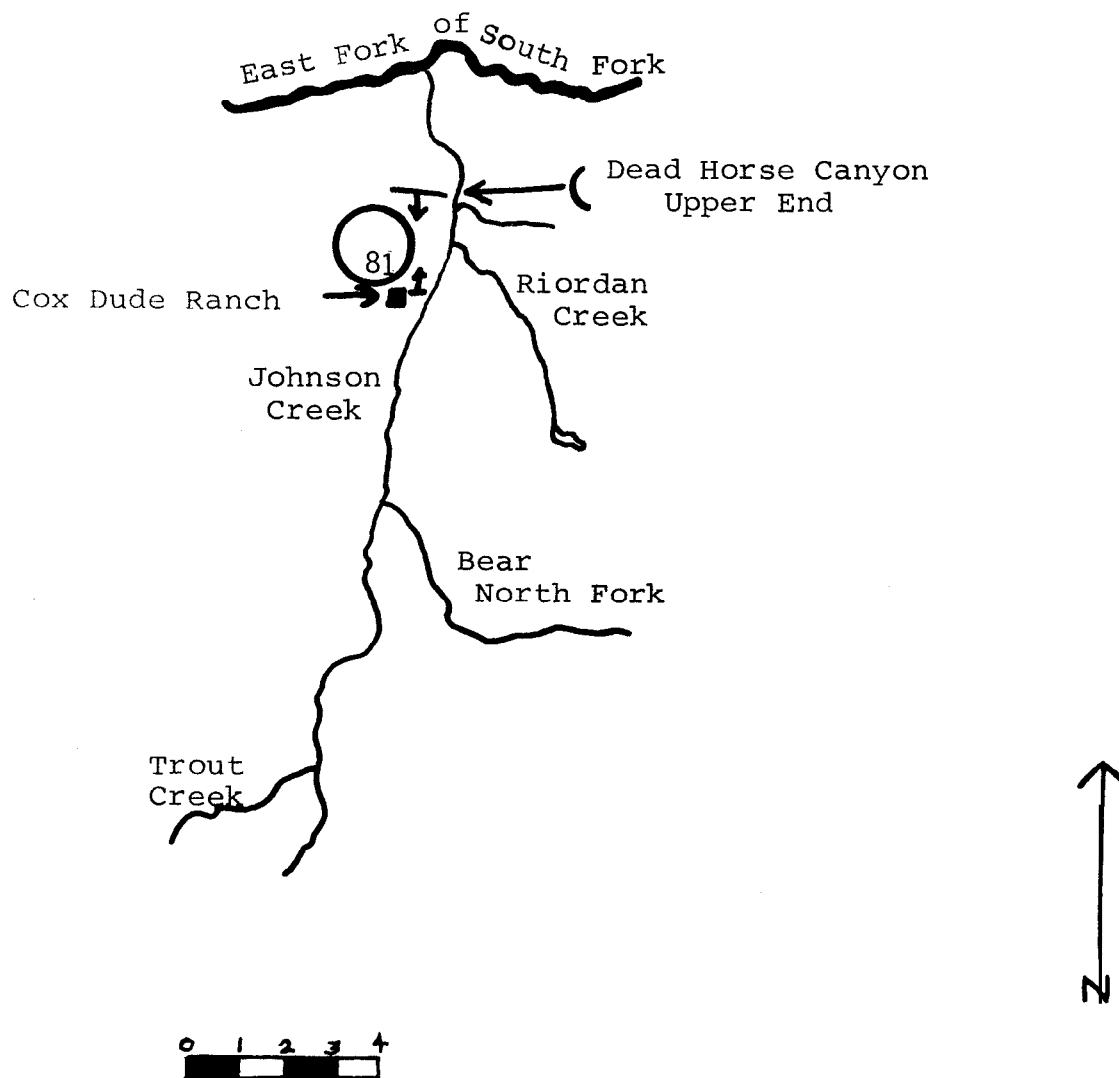
DRAINAGE E. F. of South Fork SURVEY DATE 9/10/77

STREAM Johnson Creek MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS Good OBSERVER Welsh

TIMING: ~~XXXX~~ On Time ~~XXXX~~ (mark one)

REMARKS: _____



DRAINAGE S. F. Salmon River

SURVEY DATE _____

STREAM Secesh and Lake Creek

MAP SCALE 1" = 4 miles

OBSERVATION CONDITIONS good

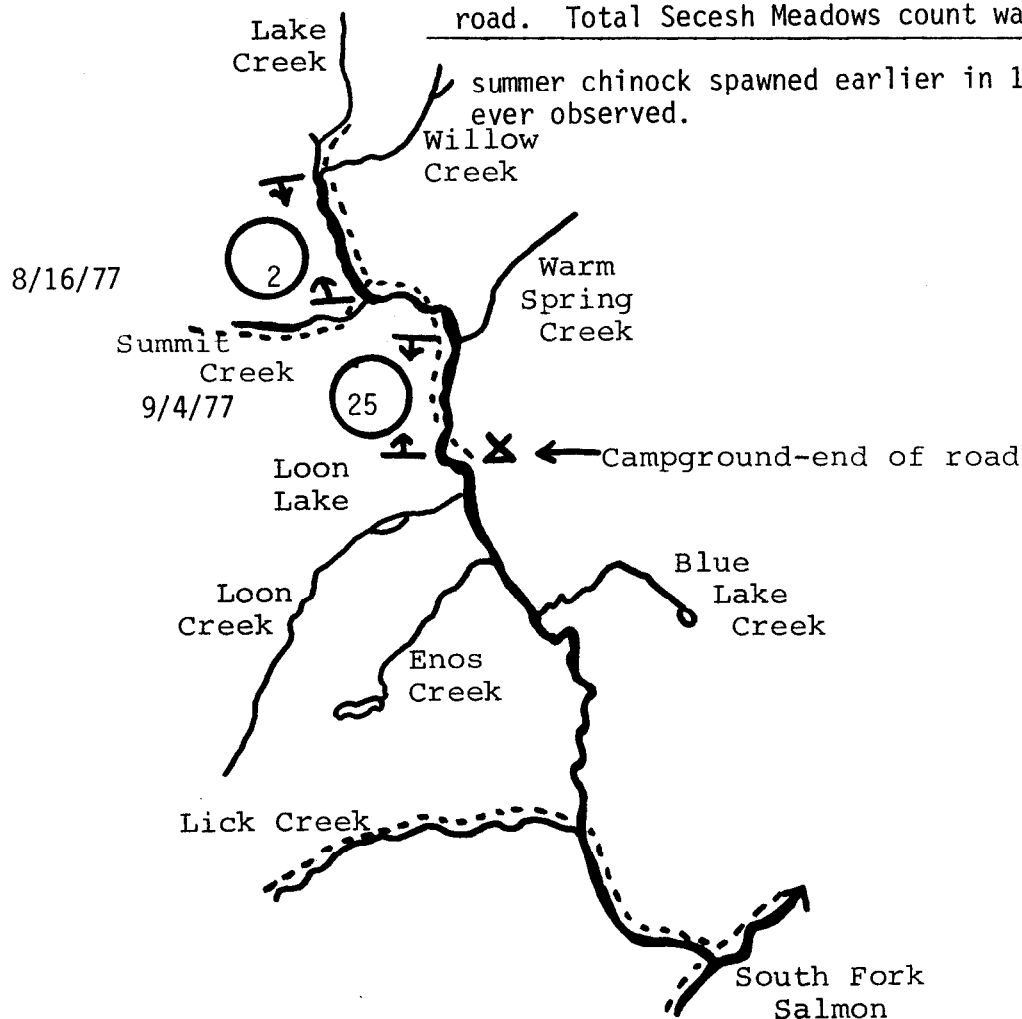
OBSERVER Welsh

TIMING: Early On Time Late (mark one)

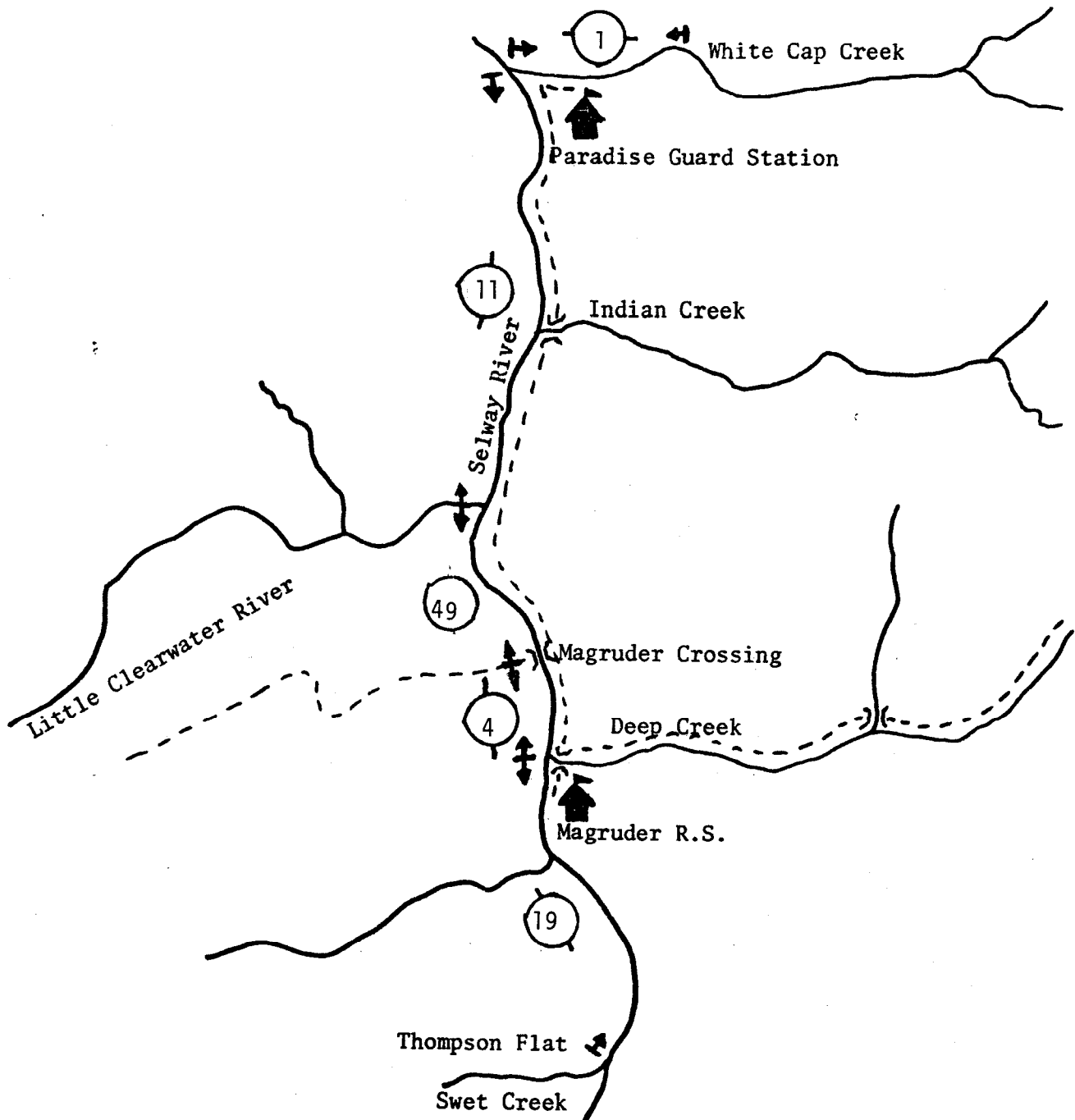
REMARKS: Counted 25 redds from upper bridge to Long Gulch Bridge and 13
redds from Long Gulch Bridge to church camp ground at end of

road. Total Secesh Meadows count was 38 redds. The

summer chinock spawned earlier in 1977 than I have
ever observed.

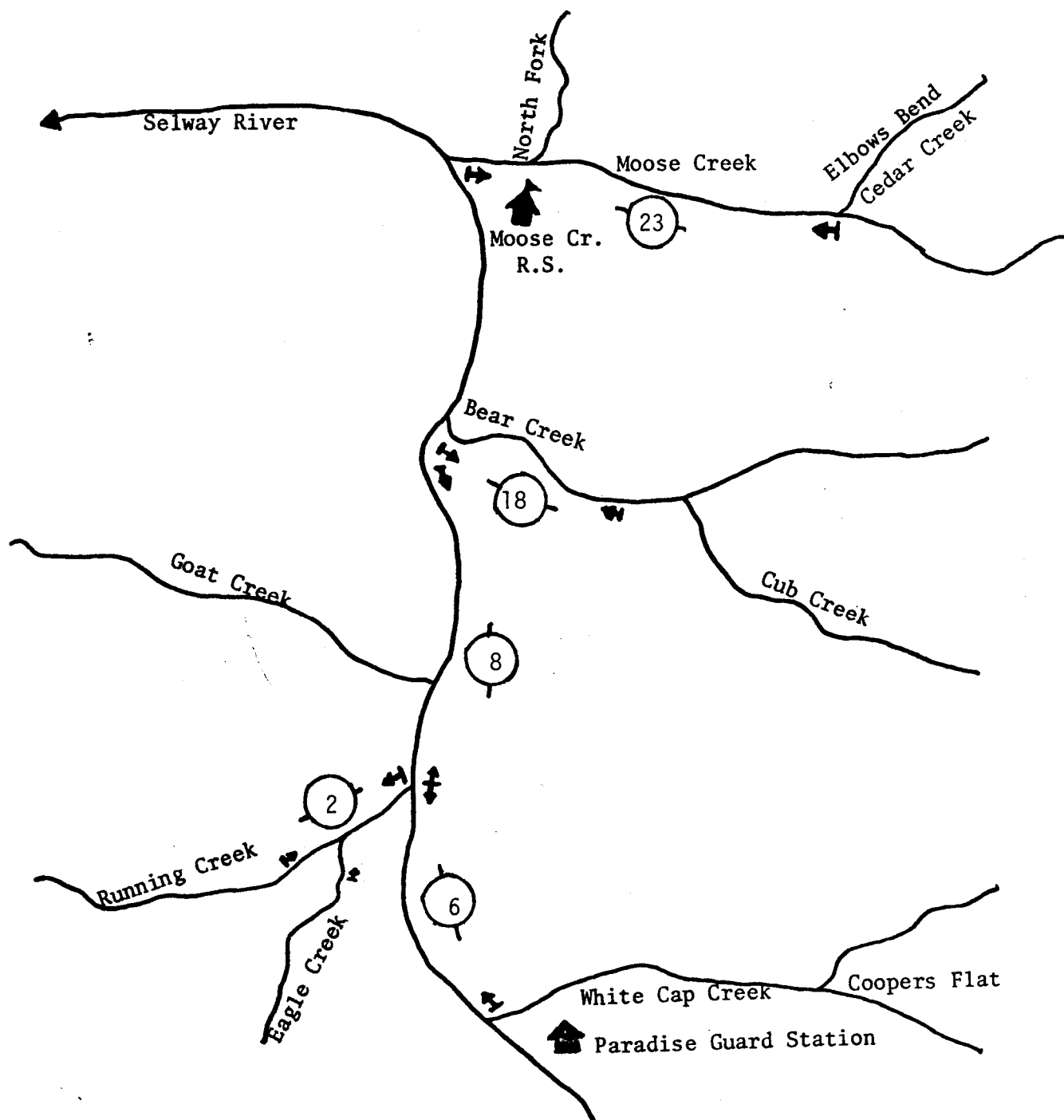


DRAINAGE Clearwater River SURVEY DATE Ground - 9/14/77
Aerial - 9/7/77
 STREAM Selway River & tributaries MAP SCALE $\frac{1}{4}$ " = 1 mile
 OBSERVATION CONDITIONS Good OBSERVER Hoss
 TIMING: Early On Time Late (mark one)
 REMARKS: _____

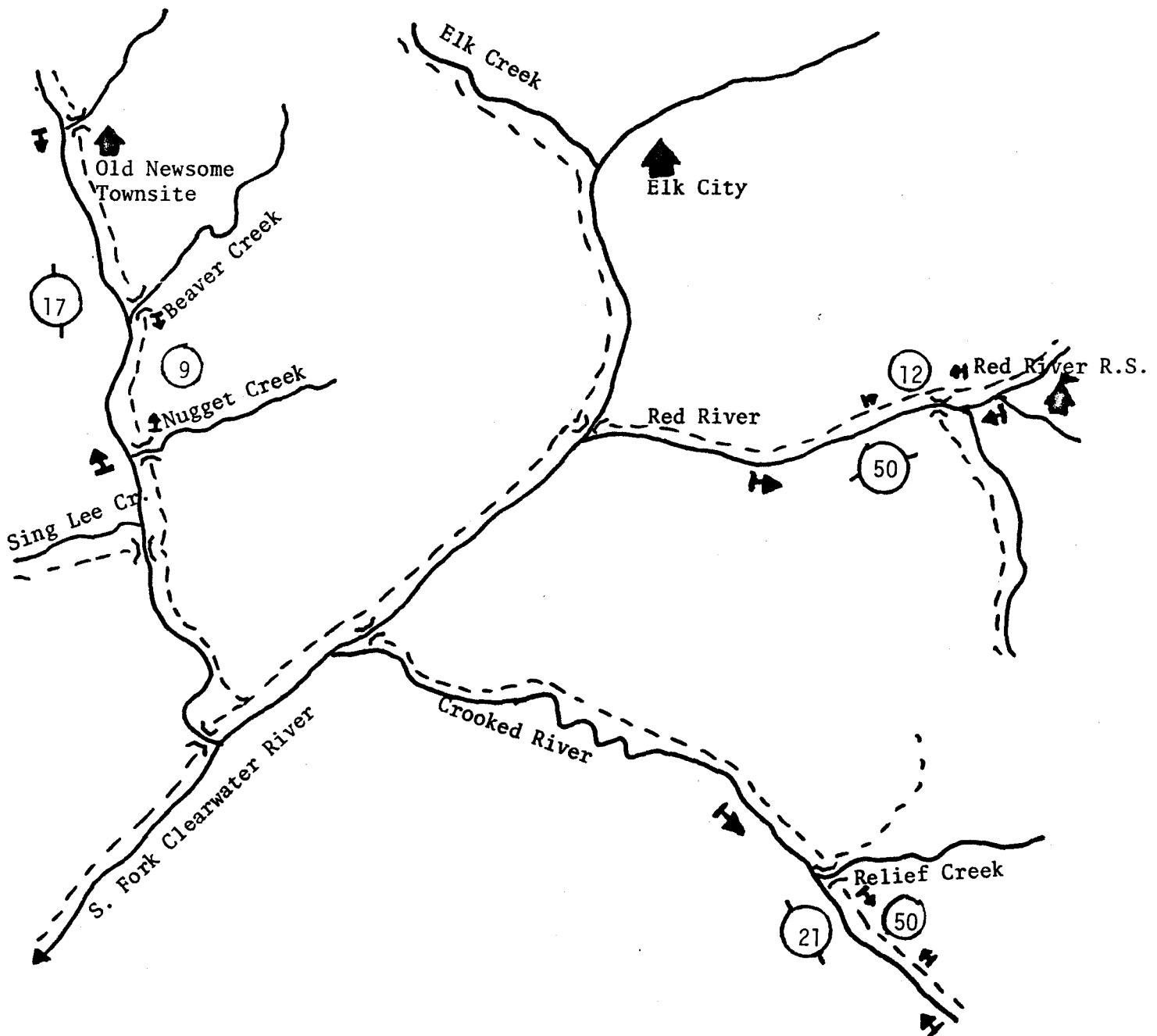


DRAINAGE Clearwater River SURVEY DATE Aerial - 9/7/77
STREAM Selway River & tributaries MAP SCALE $\frac{1}{4}$ " = 1 mile
OBSERVATION CONDITIONS Good OBSERVER Hoss
TIMING: Early On Time Late (mark one)

REMARKS:



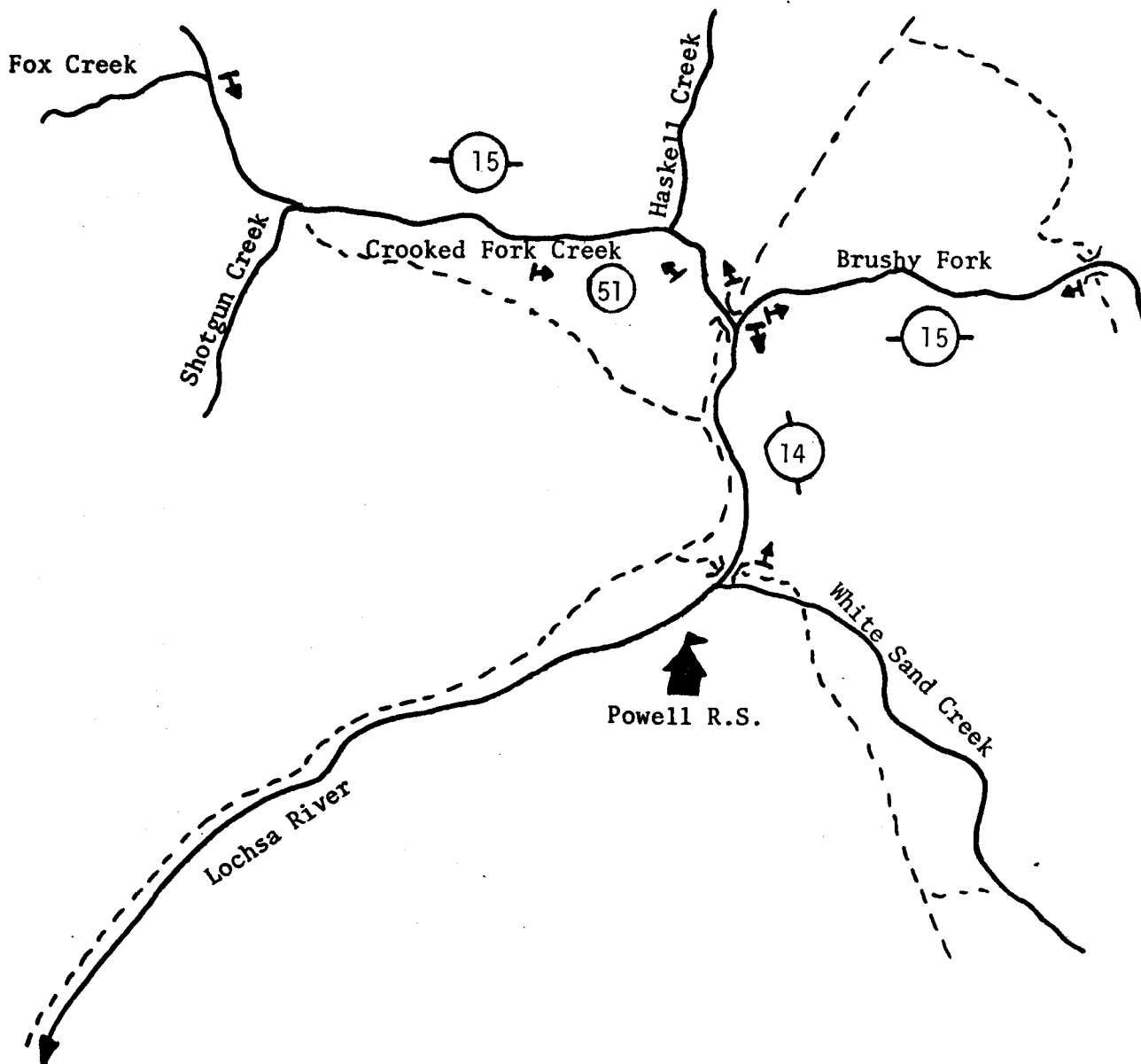
DRAINAGE	<u>S. Fork Clearwater R.</u>	SURVEY DATE	Ground - 9/2/77 Aerial - 9/6/77
STREAM	<u>As noted</u>	MAP SCALE	$\frac{1}{4}" = 1 \text{ mile}$
OBSERVATION CONDITIONS	<u>Good</u>	OBSERVER	<u>Hoss</u>
TIMING: Early <u>On Time</u> Late (mark one)			
REMARKS: _____			



DRAINAGE Lochsa River SURVEY DATE Ground - 8/29/77
Aerial - 9/1/77
STREAM As noted MAP SCALE 1/4" = 1 mile
OBSERVATION CONDITIONS Good OBSERVER Hoss

TIMING: Early On Time Late (mark one)

REMARKS: _____

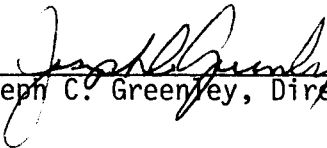


Submitted by:

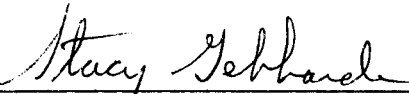
Thomas L. Welsh, Regional Fishery Biologist
Steven A. Hoss, Regional Fishery Biologist
Kent W. Ball, Regional Fishery Biologist

Approved by:

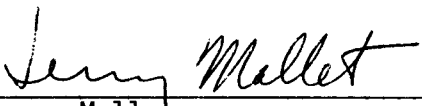
IDAHO DEPARTMENT OF FISH AND GAME



Joseph C. Greenley, Director



Stacy Gebhardt, Chief
Bureau of Fisheries



Jerry Mallet
Fishery Research Supervisor
Bureau of Fisheries